What is claimed is:

1. A composite transducer array, comprising:

a piezoelectric polymer composite panel having opposing first and second surfaces;

a continuous electrode coupled to said first surface of said piezoelectric polymer composite panel; and

a plurality of electrode segments electrically isolated from one another and coupled to said second surface of said piezoelectric polymer composite panel, each of said plurality of electrode segments shaped as an angular segment of a circular ring, said plurality of electrode segments arranged on said second surface to define an array of concentric circular rings of electrode segments.

2. A composite transducer array as in claim 1 further comprising a plurality of signal lines, each of said plurality of signal lines passing through said piezoelectric polymer composite panel and electrically coupled to one of said plurality of electrode segments.

3. A composite transducer array as in claim 1 wherein each of said plurality of electrode segments in a corresponding one of

said concentric circular rings of electrode segments has the same radial width.

4. A composite transducer array as in claim 1 wherein each of said plurality of electrode segments in a corresponding one of said concentric circular rings of electrode segments has the same arc length.

5. A composite transducer array as in claim 1 wherein each of said plurality of electrode segments in a corresponding one of said concentric circular rings of electrode segments has the same radial width and the same arc length.

6. A composite transducer array as in claim 1 wherein said piezoelectric polymer composite panel comprises:

a plurality of piezoelectric rods spaced apart from one another and spanning between said first and second surfaces; and

a viscoelastic material filing spaces between said plurality of piezoelectric rods between said first and second surfaces.

7. A composite transducer array as in claim 6 wherein said viscoelastic material comprises a thermoplastic epoxy.

8. A composite transducer array as in claim 1 wherein said continuous electrode defines a first transducer plane and said plurality of electrode segments define a second transducer plane, and wherein said first transducer plane and said second transducer plane are parallel to one another.

9. A composite transducer array as in claim 1 wherein said continuous electrode defines a first transducer plane and said plurality of electrode segments define a second transducer plane, and wherein said first transducer plane and said second transducer plane are shaped in correspondence with one another.

10. A composite transducer array assembly, comprising:

a waterproof housing open at one end thereof;

an acoustic absorbing material partially filing said waterproof housing;

a continuous electrode fitted in said waterproof housing, said continuous electrode flush with and spanning said one end thereof, wherein said continuous electrode has a first side facing into said waterproof housing and a second side facing out of said waterproof housing;

a piezoelectric polymer composite panel having opposing first and second surfaces, said piezoelectric polymer composite panel fitted in said waterproof housing with said first surface thereof coupled to said first side of said continuous electrode; and

a plurality of electrode segments electrically isolated from one another and coupled to said second surface of said piezoelectric polymer composite panel, each of said plurality of electrode segments shaped as an angular segment of a circular ring, said plurality of electrode segments arranged on said second surface to define an array of concentric circular rings of electrode segments that abuts said acoustic absorbing material.

11. A composite transducer array assembly as in claim 10 further comprising a plurality of signal lines, each of said plurality of signal lines passing through said acoustic absorbing material and said piezoelectric polymer composite panel before being electrically coupled to one of said plurality of electrode segments.

12. A composite transducer array assembly as in claim 10 wherein each of said plurality of electrode segments in a corresponding

one of said concentric circular rings of electrode segments has the same radial width.

13. A composite transducer array assembly as in claim 10 wherein each of said plurality of electrode segments in a corresponding one of said concentric circular rings of electrode segments has the same arc length.

14. A composite transducer array assembly as in claim 10 wherein each of said plurality of electrode segments in a corresponding one of said concentric circular rings of electrode segments has the same radial width and the same arc length.

15. A composite transducer array assembly as in claim 10 wherein said piezoelectric polymer composite panel comprises:

a plurality of piezoelectric rods spaced apart from one another and spanning between said first and second surfaces; and

a viscoelastic material filing spaces between said plurality of piezoelectric rods between said first and second surfaces.

16. A composite transducer array assembly as in claim 15 wherein said viscoelastic material comprises a thermoplastic epoxy.

17. A composite transducer array assembly as in claim 10 wherein said continuous electrode defines a first transducer plane and said plurality of electrode segments define a second transducer plane, and wherein said first transducer plane and said second transducer plane are parallel to one another.

18. A composite transducer array assembly as in claim 10 wherein said continuous electrode defines a first transducer plane and said plurality of electrode segments define a second transducer plane, and wherein said first transducer plane and said second transducer plane are shaped in correspondence with one another.